1995
YEARBOOK

Connecting Mathematics across the Curriculum

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NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS

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Library of Congress Cataloging-in-Publication Data:

Connecting mathematics across the curriculum / [edited by] Peggy A. House, Arthur F. Coxford.
p. cm. — (Yearbook ; 1995)
Includes bibliographical references.
ISBN 0-87353-394-1
1. Mathematics—Study and teaching. I. House, Peggy.
II. Coxford, Arthur F. III. Series: Yearbook (National Council of Teachers of Mathematics) ; 1995.
QA1.N3 1995
[QA11]
510'.71'2 s—dc20
[510'.71'2] 94-48261
CIP

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Printed in the United States of America

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Preface

One of the four cornerstones of the NCTM *Curriculum and Evaluation Standards for School Mathematics* asserts that connecting mathematics to other mathematics, to other subjects of the curriculum, and to the everyday world is an important goal of school mathematics. Among recent reports calling for reform in mathematics education, there is widespread consensus that mathematics must be made accessible to all students, that it must be presented as a connected discipline rather than a set of discrete topics, and that it must be learned in meaningful contexts that connect mathematics to other subjects and to the interests and experience of students.

This yearbook illustrates the connections and uses of mathematics within mathematics itself, between mathematics and other disciplines, and in the life, culture, and occupational experiences of adult communities. It is designed to help classroom teachers, teacher educators, supervisors, and curriculum developers broaden their views of mathematics and to suggest practical strategies for engaging students in exploring the connectedness of mathematics.

The yearbook is organized in five parts. Part One, chapters 1 through 4, addresses general issues and various perspectives as they relate to the development and uses of mathematical connections. The papers in this section explore the meaning and scope of mathematical connections and the role of connections in teaching and learning mathematics.

An important outcome of mathematics education is to present mathematics as a unified discipline, a woven fabric rather than a patchwork of discrete topics. Papers in Part Two, chapters 5 through 10, focus on connections within mathematics itself. They illustrate how concepts emerge in the early grades and grow in sophistication and applicability throughout the mathematics curriculum. Papers in this section illustrate how numerical concepts and the basic operations of arithmetic are connected to geometric concepts and how the all-important concept of *function* develops across the curriculum. One important conceptual strand, that of *transformations,* is developed in detail through three related papers as an illustration of the richness of mathematical topics.

But mathematics is not an isolated body of knowledge. To be useful, mathematics should be taught in contexts that are meaningful and relevant to learners. Papers in Parts Three, Four, and Five illustrate opportunities to connect mathematics across the curriculum of the elementary, middle, and secondary school years, respectively. The examples include connections to other school subjects and to mathematics as it is used in adult life.

The production of this yearbook represents the efforts of many dedicated professionals over a three-year period. More than sixty manuscripts were received in response to our call for papers; fewer than half of those submitted could be accepted. To all who gave of their time and talents to answer the call for papers, and especially to the thirty-nine authors of the twenty-six papers in this publication, the Editorial Panel and I express our deep appreciation.

The tasks of developing the guidelines for this yearbook, of reviewing all the submitted papers, of selecting the papers to be included, and of guiding the development of the final product fell to the Editorial Panel, a talented and generous group of colleagues for whom I have great admiration and sincere gratitude:

Jerry Becker	Southern Illinois University
Gary Froelich	COMAP (Consortium for Mathematics and Its Applications)
Linda Sheffield	Northern Kentucky University
Irvin Vance	Michigan State University
Arthur Coxford	University of Michigan

A special word of thanks is owed to Art Coxford, series editor for the 1993 through 1995 Yearbooks, who was a full and active participant in the workings of the Editorial Panel and whose support and wise counsel were never lacking. Our thanks, as well, go to the talented editorial and production staff at the NCTM Headquarters Office, whose efforts transformed a collection of papers into a finished publication.

The writers of these papers have endeavored to make mathematics come alive for the readers of this yearbook. In so doing, they present us all with a challenge to do likewise for the students we teach. It is our hope that the ideas brought forth in this publication will become catalysts for teachers to develop and implement many more rich contexts for connecting students to the fascinating world of mathematics.

PEGGY A. HOUSE
1995 Yearbook Editor